STUDIES IN STREPTOCARPUS III: THE STREPTOCARPUS FANNINIAE ALLIANCE*

O. M. Hilliard
(*Bews Botanical Laboratories, University of Natal, Pietermaritzburg*).

This is the third in a series of papers on the subgenus* Streptocarpus *in South East Africa. It should be read in conjunction with the introduction to the first paper* (*Hilliard,* **Jnl. S. Afr. Bot. 32, 1).

S. fanniniae and its allies range from the mountains of Swaziland and the eastern Transvaal through the higher regions of Natal to the mountains of the eastern Cape. *S. fanniniae* itself is confined to Natal and Zululand forests at altitudes of between 900 and 1500 m. It is closely allied to *S. candidus*, so far known only from Ngome forest (900 to 1200 m.),[1] and to *S. wilmsii* which extends from Mbabane, Swaziland, along the mountains of the eastern Transvaal to Mariepskop, in forest patches between 1200 and 1650 m. in altitude. *S. pusillus* is confined to the Drakensberg and its outliers from the Orange Free State around Harrismith through Natal and the Basutoland border to the eastern Cape. It has close affinity with *S. davyi*, endemic to Swaziland, where it is common around Mbabane. The latter two species are found in the shelter of rock outcrops, although *S. pusillus* sometimes grows in forest.

That these five species form a natural alliance is not immediately apparent; it is largely diversity in growth form among the species that is misleading. A more critical inspection shows, however, that in addition to certain androecial and gynoecial characters in common, the species display a number of other unifying features, notably corolla form and patterning, and, in some of the species, a distinctive type of branching of the floral axis.

The strong floral resemblance between *S. pusillus* and *S. davyi* is striking, and that between *S. candidus* and *S. wilmsii* is so marked that flowers of the former species are most easily distinguished by the violet-coloured inverted vees at the base of the lower lip. The corollas of all four species are much the same shape and it is only disparity in size that creates an illusion of dissimilarity between the species pairs. Corolla shape in *S. fanniniae* differs from that of the others mainly in the two upper lobes being porrected instead of reflexed.

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[1] Since this was written, *S. candidus* has been collected at two other localities in Natal: Mahlabatini dist., Ceza, *Burtt and Hilliard* 3296, E, NU; Vryheid dist., Nhlazatshe Mt., *Burtt and Hilliard 3332*, E, NU.

In *S. fanniniae*, the flowers are often pale blue, though whitish forms are frequent. Those of the other species generally have a white ground, but the corolla of *S. wilmsii* is often suffused violet-blue and there is one report of some mauve specimens in a population of *S. pusillus*. But ground colour in *Streptocarpus* generally is without much taxonomic significance. Of greater import is the type of patterning on the corolla.

Both *S. wilmsii* and *S. candidus* have a yellow stripe and violet spots on the floor of the corolla tube. In *S. fanniniae*, the floor of the tube is nearly always spotted, occasionally striped, violet, and the two keels in the throat are often yellow. The corolla tube in both *S. davyi* and *S. pusillus* is immaculate and although yellowing in the throat or on the floor of the tube has never been recorded in *S. pusillus*, it is sometimes present in *S. davyi*.

The relationship between *S. candidus*, *S. wilmsii* and *S. fanniniae* is further emphasized by their having an identical perfume.

The close affinity of *S. pusillus* and *S. davyi* and of *S. wilmsii* and *S. candidus* is undoubted. *S. fanniniae* on the other hand shares some floral characters including perfume with the first species pair, and with the second pair, not only floral characters, but also a unique pattern of branching of the floral axis, unique, that is, among the South African representatives of the subgenus, although a tendency towards this type of branching can sometimes be seen in *S. bolusii*, in an undescribed Transvaal species allied to *S. bolusii*, and in *S. rimicola*. The same pattern is evident in some Tropical African species, notably *S. bullatus* from Tanganyika.

Because of close floral resemblance among the species, the most reliable and most easily applied diagnostic criterion for separating the closely allied species is habit, the very feature that creates an illusion of dissimilarity in the alliance. *S. wilmsii* is unifoliate and generally monocarpic but shows a tendency towards the production of accessory leaves, *S. candidus* is rosulate and perennial, *S. fanniniae* is perennial with a unique system of creeping, branching petioles, *S. pusillus* is monocarpic and usually two- to three-leaved, and *S. davyi* is several-leaved and perennial.

GENERAL CHARACTERISTICS OF S. FANNINIAE ALLIANCE

Herbs, sometimes stemless, but three species with erect flowering axes, monocarpic or perennial, terrestrial or epiphytic. *Leaves* 1 to numerous, apex usually withered, margin crenate, upper surface rugulose, veins impressed above, prominent below. *Inflorescences* cymose, several in acropetal succession from base of midrib or apex of petiole. *Calyx* 5-partite. *Corolla* bilabiate, *tube relatively broadly subcylindric, mouth cylindric, limb almost straight*, patterning, if present, of bluish-violet spots or streaks, often associated with one or two yellow stripes, on floor of tube and base of lower lip, upper lip 2-lobed, lower 3-lobed. *Stamens:* fertile 2, included, inserted one-third up corolla tube, filaments white, twisted, curved, curve dilated, *usually conspicuously toothed at junction with connective;* anthers introrse, lobes 2, applanate; staminodes often very conspicuous. *Disc* annular, orange. *Ovary* terete; *style dorso-ventrally compressed, approximately equal in length to ovary; stigma of two unequal, reniform, papillose lips* (lips occasionally obscure in *S. davyi*) held in the median plane. *Capsule relatively short with a prominent apiculus.*

KEY TO *S. FINNINAE* ALLIANCE

1a	Flower up to 25 mm. long.	2	
1b	Flower longer than 25 mm.	3	
2a	Plant monocarpic, consisting of one leaf, often with a second (and occasionally third) petiolate leaf developing sympodially from the petiole of the primary leaf		5. *S. pusillus*
2b	Plant perennial with the same growth pattern as above, but in addition several accessory leaves at base of primary petiole ..		4. *S. davyi*
3a	Leaf usually one, very occasionally one or two much smaller leaves at base of primary leaf, base cordate to cuneate		2. *S. wilmsii*
3b	Leaves several, base cuneate	4	
4a	Plant with a unique system of creeping, branching, rooting petioles; each leaf developing accessory leaves, often in pairs, from its petiole		1. *S. fanniniae*
4b	Leaves arranged in a rosette	5	
5a	Corolla white, lower lip marked with two deep violet inverted vees		3. *S. candidus*
5b	Corolla pale bluish-violet, lower lip marked with deep violet, interrupted lines, upper lobes with strong median lines ..		1. Putative *fanniniae* × *gardenii*

1. **S. fanniniae** Harv. ex C.B. Cl. in DC. Monog. Phan. 5:150 (1883); C.B. Cl. in Fl. Cap. 4(2):444 (1904); B. L. Burtt in R.H.S. Dict. Gard. ed. 2, 4:2044 (1956). Natal, Dargle Farm near Umgeni river, *Mrs. Fannin* 55, K, HOLOTYPE, NH, TCD, ISOTYPES.

Var. β minor C.B. Cl. in DC. Monog. Phan. 5:151 (1883), Natal, sine loc., *Mrs. Saunders* s.n., K, HOLOTYPE. *S. woodii* C.B. Cl in Dyer, Fl. Cap. 4(2):445 (1904); B. L. Burtt in R.H.S. Dict. Gard. ed. 2, 4:2045 (1956). Natal, "Liddesdale", *Wood* 3931, K, NH, Noodsberg, *Wood* 4234, K, NH, Ixopo, Entalramu, *Mrs. E. S. Clarke* s.n., BM, K, SYNTYPES.

Perennial herb with elongate, erect flowering axes, and creeping, rooting petioles. *Leaves* numerous, up to 900 × 220 mm., often smaller, base cuneate, upper surface green, glossy, sparsely pilose becoming glabrescent, lower paler,

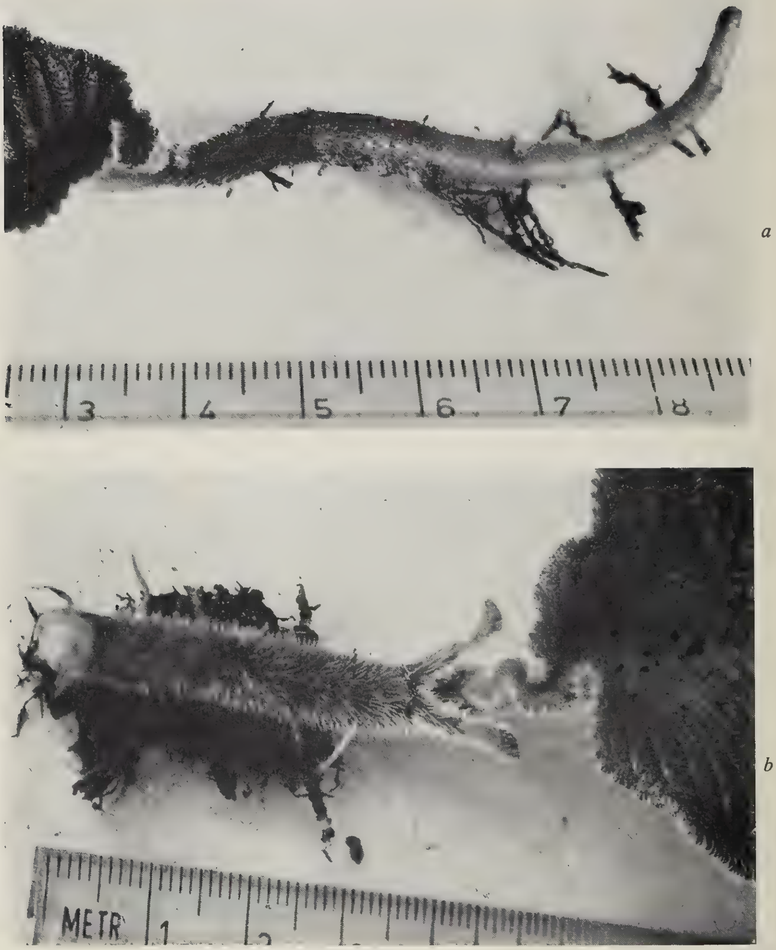
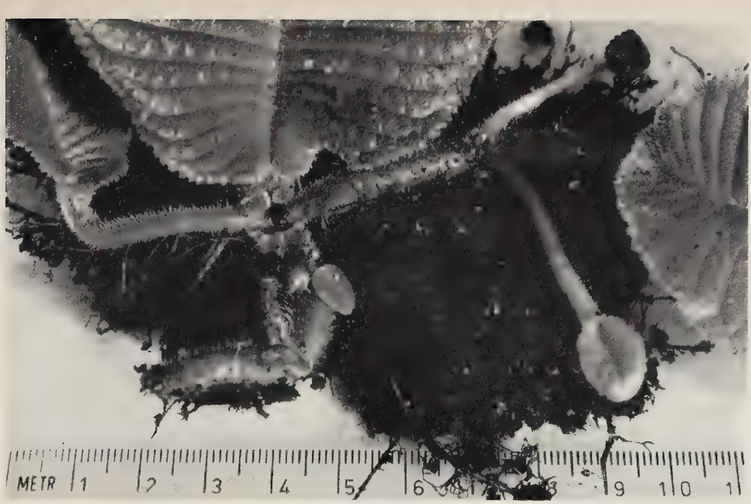


PLATE 1

Parts of plants of *S. fanniniae*. (*a*) leaf with elongated, rooting petiole. Primordia of two pairs of accessory leaves can be seen, the first immediately below the junction of lamina and petiole, the second about 3 cms below the first. (*b*) A similar leaf with petiole and lamina of an apical pair of accessory leaves now differentiated. (*c*) later stage in growth with petioles of accessory leaves elongated and rooting. One accessory petiole has itself produced a second pair of leaves. (*d*) erect flowering axis which can be produced by any leaf (see text, p. 280 and Plate 2c). *a–c* scale in cms, *d*, about half natural size.



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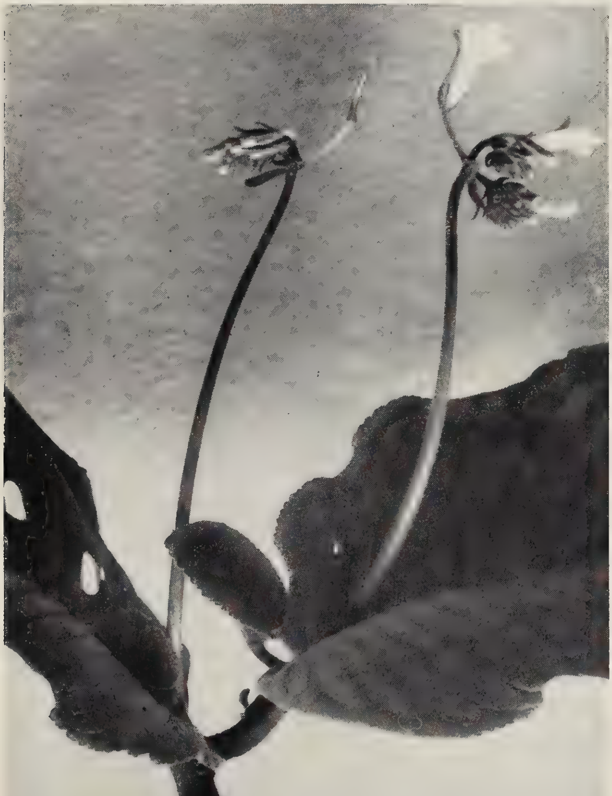

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glabrescent, veins pilose; petiole stout, of indeterminate length, up to 15 mm. in diam., creeping, rooting, green of reddish-brown, pilose. *Inflorescences* from apex of petiole and base of midrib, many flowers expanded simultaneously. *Peduncle* up to 300 mm. long, green, pilose with glandular and eglandular hairs. *Bracts* elliptic, up to 12 × 4 mm., green, sparsely pilose. *Flower* 28—40 mm. long, honey-scented. *Pedicel* 14 mm. long, elongating slightly in fruit, pale purplish-red, densely glandular, sparsely pilose. *Calyx* lobes linear, 10 × 1·5 mm., green to purplish, glandular-pilose. *Corolla* tube slightly curved, whitish below, pale blue above, glandular-pilose, 18—23 mm. long, throat 7—9 mm. in diam.; upper lobes porrected, suborbicular, 6—8 × 7—9 mm.; lower lip porrected, 15—18 mm. long, lobes elliptic to suborbicular, 5—10 × 5—10 mm.; all lobes whitish, sparsely glandular outside, pale blue, glabrous inside, with 2 keels extending from base of anterior lobe into throat and along floor of tube. *Stamens:* filaments 9 mm. long, white, abruptly curved, curve dilated, sparsely glandular; anther lobes 1·5 mm. long, yellow, glandular; posterior staminode minute, laterals 6 mm. long, obscurely bifid, white, glandular. *Ovary* 8 mm. long, white, pilose with glandular and eglandular hairs; style 6 mm. long, white, sparsely glandular or glabrous. *Capsule* 30—62 (47 ± 7) mm. long, 2 mm. in diam.

Flowering period: November to April.

NATAL: Ngotshe dist., Ngomi forest station, *Codd* 9596, PRE; Ingoma (Ngome), *Gerrard* 1980, TCD; Ngome forest, c. 1200 m., *Hilliard* 866, K, NU. Vryheid dist., Vryheid east, *Gerstner* s.n., NBG 881/35. Nkandla dist., Nkandla forest, 1070 m., *Hilliard* 916, NU; Qudeni forest, *Fisher and Schweickerdt* 112, NH, NU, PRE, do., *Gerstner* 2859, K, NH, PRE. Umvoti dist., near Lilani, 930 m., *Hilliard* 842, NU; near Ahrens, farm "Mowbray", *Fisher* 963, NU; Lions River dist., near Dargle Farm, Umgeni [river], *Hallack* 2, TCD; Lidgetton, *Wood* 6302, BM (mixed gathering), K, PRE; farm "The Dargle", 1524 m., *Hilliard* 1212, E, K, NU; Dargle, farm "Kilgobbin", 1310 m., *Hilliard* 847, E, NBG, NU; near Howick, farm "Gowan Brae" ("Liddesdale"), 1370 m., *Hilliard* 858, E, K, NU. Mapumulo dist., 7 mls. Mapumulo village en route Kranskop, *Tinley* s.n., NU; Pietermaritzburg dist., Sevenfontein, 9—1200 m., *Wylie* com. *Wood* 8121, GRA. Richmond dist., Richmond, Enon forest, *Hilliard* 2030, NU.

S. fanniniae is widespread in the Natal Midlands and parts of Zululand at altitudes ranging from 900 to 1500 m. It is found only in well illuminated forest along streams or seepage lines either rooted in very damp soil or creeping over rocks in the streambed, or clinging to wet rock faces at waterfalls and cascades. The vegetative growth form is quite unlike that of any other South African species. The cotyledonary leaf becomes petiolate, which is not in itself unusual,

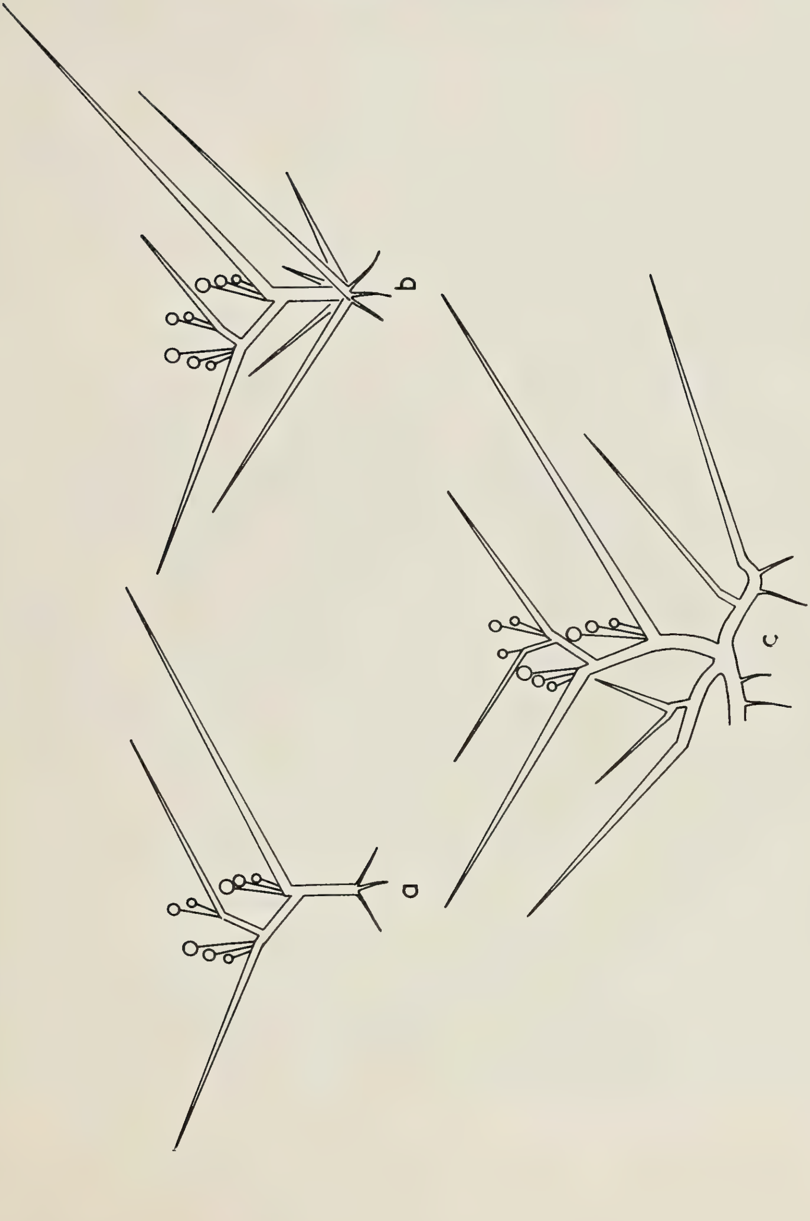

PLATE 2

Schematic diagram to show growth patterns in (*a*) *S. pusillus* (whole plant), (*b*) *S. davyi* (whole plant) and (*c*) *S. fanniniae* (part of plant). See text for discussion. (Drawings not to scale.)

but the petiole elongates considerably and one or two petiolate accessory leaves develop near its apex. The primary cotyledonary leaf and accessory leaves are soon indistinguishable. The petioles continue elongating and thickening and adventitious roots develop wherever they touch the ground. Further leaves develop from the petioles, which may branch, spreading over the surface of soil or rock, clinging tenaciously by the adventitious roots. Dense tangles of rooted leaves result. (Plate 1a-c). Inflorescences develop from the apex of the petiole and the base of the midrib of a flowering leaf. Several petiolate flowering leaves may develop sympodially from the apex of an initial flowering petiole. (Plates 1d and 2c). The flowering leaves are held erect, and only the petiole at the base of the flowering axis is rooted. A flowering branch may reach a metre in height. Within any population, there is some variation in size of the corolla tube, shape and size of the corolla lobes, colour, and markings on the floor of the corolla tube. (Plate 3). Variation between populations can be even more marked. Plate 4 illustrates variation in corolla shape between several populations. Colour and markings can be very variable too. For example, near Howick on the farm "Liddesdale" (now "Gowan Brae" and one of the type localities of *S. woodii*) corolla colour varies from almost white to pale blue, and the keels on the floor of the tube are pale blue flanked by deep violet, interrupted lines. At Lilani, not far from the Noodsberg, the corolla is very pale blue, the keels yellow flanked by deep violet splotches. Populations on the farm "The Dargle", near the source of the Umgeni river, have pale blue to whitish corollas, the keels pale yellow or whitish, spotted violet. On nearby "Kilgobbin" the keels are sometimes replaced by deep violet lines on the floor of the corolla tube, a feature noticed also in populations at Karkloof and Sevenoaks.

Because of this variation, it is impossible to maintain *S. woodii*, distinguished from *S. fanniniae* mainly on corolla colour and dimensions. Clarke's other character, pollen-grain shape, is invalid because all the pollen grains are ellipsoid when dry, globose when wet.

Despite corolla variation, *S. fanniniae* is very distinctive, and it it not easily confused with any other species. Its affinities lie with *S. candidus* and *S. wilmsii*. All three species are very similar floristically, but differ markedly in growth pattern. *S. candidus* is rosulate and perennial, *S. wilmsii* solitary-leaved and usually monocarpic, and *S. fanniniae* perennial with a unique system of branching rooting petioles that give rise to accessory leaves, and with erect, elongate flowering axes. The flowers of all three smell sweetly of honey, a notable feature in an almost scentless genus, and one which draws attention to the still unsolved problem of natural pollinators. The frequency of natural interspecific hybridisation in the subgenus stresses the likelihood of insect pollination being a factor in the breeding system.

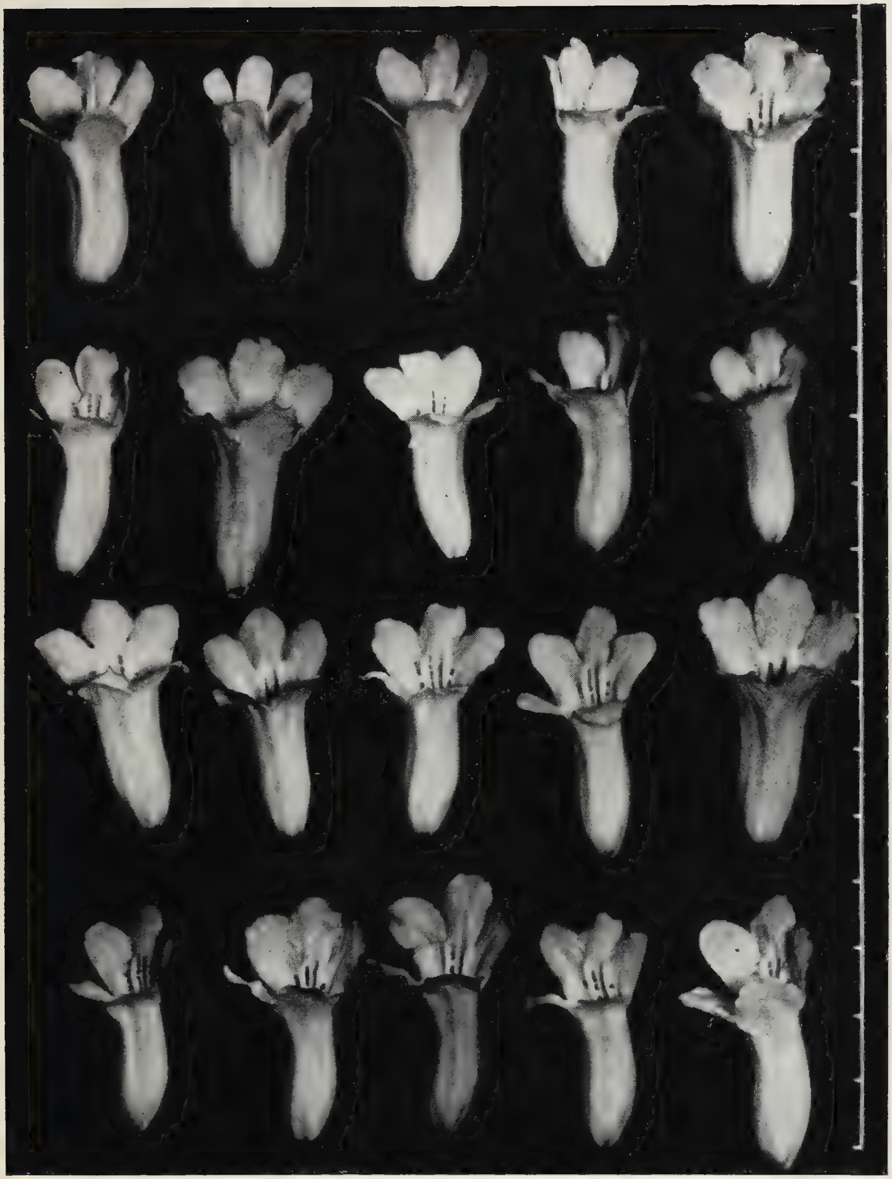

PLATE 3
A sample of 20 corollas from a population of *S. fanniniae* on the farm "The Dargle". Note differences in corolla dimensions, shape of corolla lobes and depth of colouring. Scale in cms.

On the farm "Kilgobbin" *S. fanniniae* grows in profusion along a small stream on the forest margin. *S. gardenii* is common on trees and rocks near the streambank and in the forest. Among the dense stands of *S. fanniniae* are about six clumps of a putative hybrid between the two species (*Hilliard* 848, E, NU).

Putative fanniniae × gardenii

Rosulate, perennial. *Leaves* up to 400 × 88 mm., base cuneate, decurrent on petiole, petiole up to 50 × 8 mm., curved, rooting at base. *Inflorescences* c. 20-flowered, several from apex of petiole. *Peduncle* up to 260 mm., pilose. *Bracts* elliptic, up to 4 × 2 mm., pilose. *Flower* c. 48 mm. long. *Pedicel* c. 9 mm. long, elongating slightly in fruit, pilose with glandular and eglandular hairs. *Calyx* lobes linear, 6 × 1 mm., pilose. *Corolla* tube more or less infundibuliform, almost straight, bluish-violet above, paler below, glandular-pilose, c. 25 mm. long, base 4 mm. in diam., throat 10 mm. in diam.; limb almost straight, upper lobes erect, elliptic, 12 × 11 mm., bluish-violet, almost glabrous outside, paler inside and strongly marked with one solid, and sometimes two broken, deep violet lines, glabrous except for gland-tipped hairs in throat; lower lip c. 18 mm. long, lobes elliptic, 12 × 9 mm., pale bluish-violet, glandular-pilose outside, paler, glabrous inside, marked with deep violet, broken lines; entire floor of the tube pale yellow with irregular violet spots. *Stamens:* filaments inserted about halfway up corolla tube, c. 10 mm. long, curved, thickened apically, sparsely glandular; anther lobes 2 mm. long, white. *Ovary* c. 11 mm. long, pilose, eglandular; style c. 10 mm. long, dorso-ventrally compressed; stigma of two unequal, reniform, papillose lips. *Capsule* 50—60 mm. long.

The plants are morphologically intermediate between *S. fanniniae* and *S. gardenii*, a rosulate species. The habitat favoured is more that of *S. fanniniae*, namely, along the stream-bank, but one young plant was seen on a rock face above the stream, the type of habitat preferred by *S. gardenii*. In habit, however, the putative hybrid resembles *S. gardenii*, and lacks the long spreading petioles of *S. fanniniae*. The leaves resemble those of *S. fanninae* though they are smaller. *S. gardenii* has one or two, occasionally six, flowers per peduncle; *S. fanniniae* has many; the putative hybrid has up to twenty. The shape of the corolla tube is similar to that of *S. fanniniae*, the limb more like that of *S. gardenii*, the upper lobes being marked with a strong median line and the lower with broken lines as in that species, but the floor of the tube is pale yellow spotted violet, reminiscent of *S. fanniniae*.

That the plants breed true from seed is evidenced by clumps of the putative hybrid not only being widely dispersed in the *S. fanniniae* population over several hundred yards of streambank, but also by the occurrence of a seedling

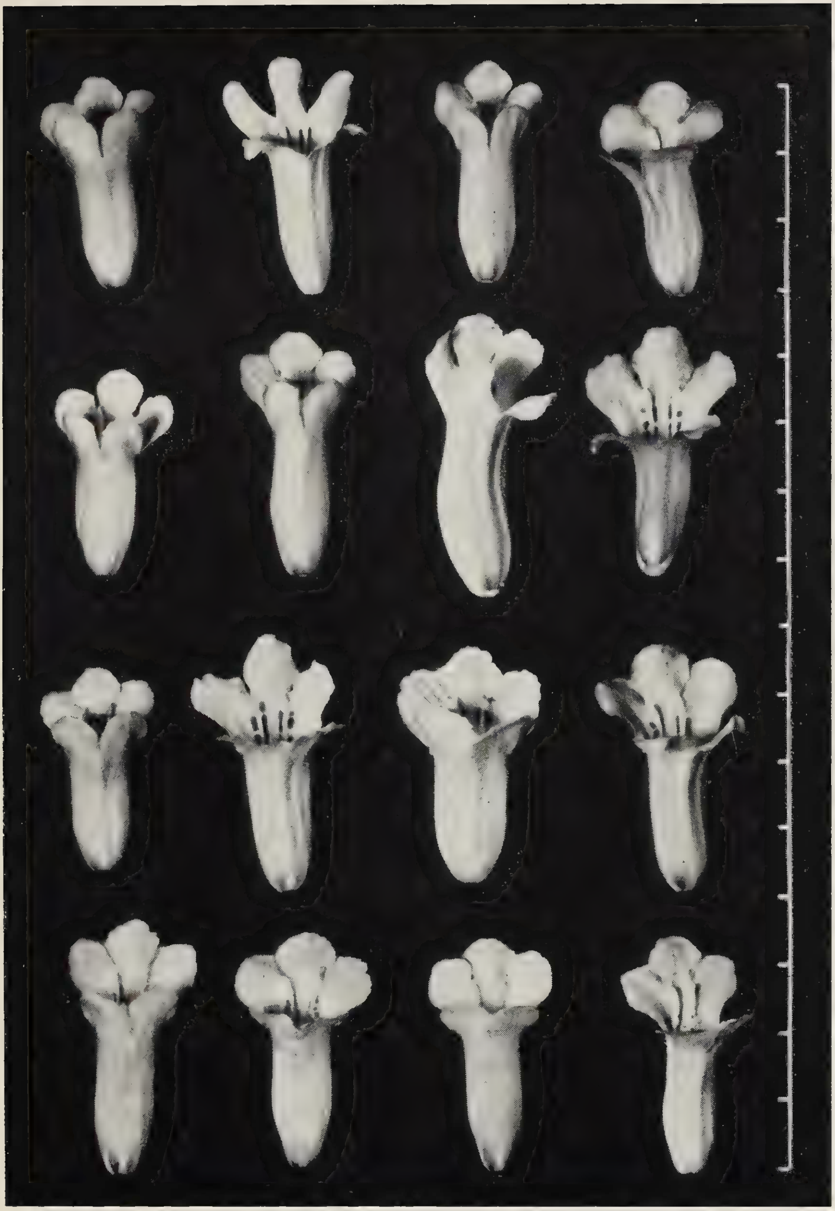

Plate 4
Corolla variation between populations of *S. fanniniae* (flowers from plants in cultivation).
Scale in cms.

plant high on a rock face above the stream. Also, plants raised from seed at the Royal Botanic Garden, Edinburgh, did not differ from the parent.

Although *S. fanniniae* and *S. gardenii* are common associates in Natal Midlands forest, no other intermediates between the two species have been seen. Indeed, the "Kilgobbin" plant is the only example I know of *S. fanniniae* appearing to hybridise naturally with another species. But a sheet of *Wood* 6302 in the British Museum includes one leaf plus a peduncle and one flower that looks remarkably like the "Kilgobbin" plant. It came from Lidgetton, not far from Dargle, the locality of "Kilgobbin". Duplicates of *Wood* 6302 at Kew and Pretoria are *S. fanniniae* only.

2. **S. wilmsii** Engl. in Engl. Jahrbuch 26:363 (1899); C.B. Cl in Dyer, Fl. Cap. 4(2):447 (1904); B. L. Burtt in Kew Bull. 1939:80 and in R.H.S. Dict. Gard. ed. 2, 4:2045 (1956). Transvaal, Lydenburg, Spitzkop, *Wilms* 1025, B, HOLOTYPE (destroyed in 1943), BM, ISOTYPE.

S. muddii C.B. Cl in Dyer, Fl Cap. 4(2):443 (1904); B. L. Burtt in Kew Bull: 1939:80. Transvaal, Umzeila, *Mudd*, K, summit Saddleback range near Barberton, *Galpin* 822, K, NBG, NH, PRE, SYNTYPES.

Monocarpic, possibly sometimes perennial. *Leaf* 1, up to 250 × 180 mm., base cordate to cuneate, upper surface light green, pilose, lower paler, pubescent. *Inflorescences* from base of midrib, many flowers expanded simultaneously. *Peduncle* up to 250 mm. long, green, pilose. *Bracts* lanceolate, up to 7 × 3 mm., green, pilose. *Flower* up to 38 mm. long, honey-scented. *Pedicel* c. 10 mm. long, doubling in length in fruit, green, pilose. *Calyx* lobes linear-lanceolate, 5 × 1 mm., green, pilose. *Corolla* tube straight, white, sometimes suffused palest violet, pilose without, sparsely glandular within, c. 25 mm. long, throat 9 mm. across, floor of tube bisected by a broad yellow streak, spotted violet and extending briefly onto lower lip; upper lobes suberect, elliptic-oblong, 9 × 8 mm.; lower lip porrected, c. 15 mm. long, lobes elliptic-oblong, 8 × 7 mm., all lobes white, pilose outside, glabrous inside. *Stamens:* filaments c. 9 mm. long, twisted, curved, curve dilated, white, sparsely glandular; anther lobes 1·5 mm. long, white; posterior staminode minute, laterals 5 mm. long, white, glandular. *Ovary* 8 mm. long, green, pubescent; style 7 mm. long, white, pubescent in lower half, glabrous above, sharply bent over at tip. *Capsule* 50—90 (6 ± 49) mm. long.

Flowering period: November to March.

Transvaal: Pilgrimsrest dist., Mariepskop, Magalieskop, *Killick and Strey* 2696, PRE, do., Forest Reserve, *Codd* 7875, PRE, do., *v/d/Schÿff* 4504, 4951, PRE, do., *Meeuse* 9999, K, PRE, do., *Burtt* 2928, E, NU; Mauchsberg, *v/d Merwe* 1649, K, PRE; Sabie, Bridal Veil Falls, *Story* 5417, PRE. Barberton dist., 1 ml. Havelock, *Story* 5362, PRE, 3 mls. SW Agnes Mine, *Story* 5451, K, PRE; forest near Agnes Mine, *Britten* 6643, PRE; Barberton, *Strey* 4066, PRE; Lomati Valley, 1500 m., *Thorncroft* 655, NH.

Swaziland: Piggs Peak dist., 4 mls. N. Havelock Mine, W end Emlembe Mt., *Reynolds* 3990, PRE; Devil's Bridge, 1680 m., *Compton* 29849, NBG; Kings Forest, c. 1500 m., *Compton* 27841, NBG, PRE, do. *Hilliard* 3101, E, K, NBG, NH, NU. Mbabane dist., "Stroma", *Compton* 25821, K, PRE; "Ukutula", *Compton* 25883, PRE; hills N. Mbabane, *Compton* 28687, NBG.

S. wilmsii is common in the forests of the eastern Transvaal and Swaziland, from Mariepskop to Mbabane. It grows on steep earth or rock banks, and is sometimes epiphytic. The plant is generally solitary-leaved and monocarpic, but it is probable that some plants at least are perennial by virtue of the occasional development of a new leaf from the stump of an old one. *Burtt* 2928 shows dry fruiting peduncles in association with new growth. Two other Mariepskop specimens (*Codd* 7875 and *Meeuse* 9999), in addition to *van der Merwe* 1649 (Mauchsberg), *Compton* 27841 (King's Forest, Swaziland) and *Britten* 6643 (Barberton), have one or two small leaves at the base of the flowering leaf. They may indicate perennation or in some cases merely be seedlings. It is difficult to judge in dried material.

In *S. wilmsii*, both branches of the dichasium are well developed and the flowers stand away from one another, giving a very open inflorescence. The white corolla spotted violet on the floor of the tube is remarkably similar to that of *S. candidus*. *S. candidus* can, however, be distinguished by the two inverted vees at the base of the lower lip, a trivial character, but one that appears to be constant and which can be detected in herbarium material (see *Gerrard* 1979, TCD) collected over a hundred years ago. In addition, the ovary of *S. wilmsii* is eglandular, that of *S. candidus* glandular.

But so close is the overall floral resemblance between these two species that they are diagnosed virtually on habit. *S. wilmsii* is unifoliate and usually monocarpic, *S. candidus* is rosulate and perennial.

In King's forest, near Havelock, Swaziland, four plants intermediate between, apparently, *S. cyaneus* and *S. wilmsii* were seen in an area where a large population of *S. wilmsii* grows in close proximity to an equally large population of *S. cyaneus*. The general likeness of the intermediates was to *S. cyaneus* with its "rosette" of leaves and funnel-shaped flowers, but the corolla tube of the putative hybrids was shorter and less abruptly narrowed to the base and the limb shorter than in typical *S. cyaneus*. In this respect, the corolla resembled that of *S. wilmsii*. Colour of tube and limb, too, resembled that of flowers in the *S. cyaneus* population, but whereas the yellow stripe on the floor of the corrolla tube is never spotted in *S. cyaneus*, that on the floor of the suspected cross was conspicuously spotted deep magenta-violet, which is characteristic of *S. wilmsii* (See *Hilliard* 3100, NU).

3. S. **candidus** O. M. Hilliard in Jnl. S. Afr. Bot. 30(3):112 (1964). Natal, Ngome forest, c. 1070 m., *Hilliard* 863, NU, HOLOTYPE.

S. luteus C.B. Cl. in DC. Monog. Phan. 5:153 (1883) p.p. quoad spec. Gerrardianum and in Dyer, Fl. Cap. 4(2):445 (1904) p.p. quoad spec. Gerrardianum.

S. candidus is known only from Ngome forest and its immediate environs, but its range could probably be extended by field work in this little-visited part of Zululand. It grows epiphytically, or on steep earth banks, spring-lines and streambanks. In wet situations it is commonly associated with *S. fanniniae*.

S. candidus, *S. wilmsii* and *S. fanniniae* form a very interesting trio in view of former emphasis on leaf number in delimiting sections of the subgenus (Fritsch, 1893 and Clarke, 1904), and their close affinity is discussed after the descriptions of the latter two species.

4. **S. davyi** S. Moore in Jnl. Bot. 1905:171. Swaziland, Mbabane, *Burtt Davy* 2836, BM, HOLOTYPE, PRE, ISOTYPE.

Perennial. *Leaves* several, the flowering ones petiolate and often developing one or two peduncle-producing leaves in succession from near apex of main petiole, up to 300 × 160 mm., light green, paler below, base subcordate, margin undulate, both upper and lower surfaces pilose with glandular and eglandular hairs; petiole up to 60 × 10 mm., light green, pilose with glandular and eglandular hairs. *Inflorescences* from apex of petiole and base of midrib, many flowers expanded simultaneously. *Peduncle* up to 140 mm. long, green, glandular-pilose. *Bracts* elliptic, up to 12 × 3 mm., green, glandular-pilose. *Flower* 15—20 mm. long. *Pedicel* 3 mm. elongating to up to 10 mm. long in fruit, green, glandular-pilose. *Calyx* lobes linear, 6 × 1 mm., pale green, glandular-pilose. *Corolla* tube slightly deflexed about the middle, 10—15 mm. long, 3 mm. diam. at base, 3 mm. in throat, slightly narrowed towards middle, white, sometimes with yellow blotch within at point of insertion of filaments, glandular-pilose with occasional acute hairs without, glabrous within; upper lobes sub-orbicular, 3 × 3·5 mm.; lower lip c. 5 mm. long, lobes sub-orbicular, 3 × 4 mm.; all lobes white, glabrous inside, glandular-pilose outside. *Stamens:* filaments 5 mm. long, white, twisted, curved, slightly thickened about the curve, glabrous; anther lobes 1 mm. long, white tinted violet; posterior staminode minute, laterals c. 2 mm. long, white. *Ovary* 4 mm. long, white, glandular-pilose; style 6 mm. long, white, pilose. *Capsule* 11—23 (16 ± 3) mm. long, 2 mm. diam.

Flowering period: January to March.

SWAZILAND: Mbabane dist., hill NE Mbabane, 1340 m., *Compton* 27549, NBG, PRE, 25352, K, PRE; Mbabane, *Story* 5432, PRE; Mbabane, Fonteyn, *Hilliard* 3068, E, K, NU, NH; Mankaiana dist., Mankaiana, *Bayliss* 1803, garden no. 21482, PRE.

S. davyi is known only from Swaziland, where it is common under granite outcrops on the hills around Mbabane. It grows in black, peaty soil, often dripping wet, in the shallow caves and crannies in the rock.

The plants are remarkably viscid. Each consists of a tuft of several sub-erect leaves. A petiole is scarcely noticeable in the small, young leaf, but as each leaf approaches flowering size, it becomes petiolate, The inflorescences, which develop at the apex of the petiole, are thus borne above the basal rosette. A second petiolate, flowering leaf usually develops at the apex of the primary petiole just below the point of origin of the inflorescences. This may in turn produce yet another petiolate, flowering leaf. The flowering axis thus branches sympodially (Plate 2b).

Several flowering axes may develop contemporaneously and each dies away after fruiting, but is replaced by accessory leaves and the plant as a whole is perennial.

The affinity of *S. davyi* is with *S. pusillus*, which it closely resembles but from which it differs in its rather longer and narrower and more viscid leaves, and in its inflorescences which are usually, but not always, more elongate than those of *S. pusillus*. But *S. davyi* is most readily distinguished by its perennial habit, that is, by the production of accessory leaves at the base of the flowering leaf or leaves.

5. **S. pusillus** Harv. ex C.B. Cl in DC. Monog. Phan. 5:149 (1883); C.B. Cl. in Dyer, Fl Cap. 4(2):443 (1904); B. L. Burtt in R.H.S. Dict. Gard. ed. 2, 4:2045 (1956).

Clarke (1883) cited three specimens: *Cooper* 1032 and 947, and *Sanderson* 511. *Cooper* 1032, comprising leaf and fruiting peduncles only, is *S. pusillus*. *Cooper* 947 is a mixture of *S. pusillus* and *S. pentherianus*, to which an annotation by B. L. Burtt draws attention. *Sanderson* 511 is *S. prolixus*.

Clarke (1904) cited in addition *Baur* 728, *Rehmann* 6916, and *Evans* 357. Baur's and Evans's specimens were correctly determined, but *Rehmann* 6916 is *S. pentherianus*.

Clarke's descriptions of *S. pusillus*, based as they are on three distinct species, must be discounted, but the name can be retained since one element can be selected as a satisfactory type. *Cooper* 1032, from the Orange Free State, but without precise locality, K (3 sheets) is therefore nominated LECTOTYPE, BM, ISOLECTOTYPE.

Monocarpic, all parts pilose with glandular and eglandular hairs. *Leaves* 1 or 2, occasionally 3, up to 220 × 160 mm., base subcordate, upper surface light green, lower paler; petiole (hypocotyl) up to 40 mm. long, rooting at base. *Inflorescences* from base of midrib, many flowers expanded simultaneously. *Peduncle* up to 120 mm. long, often much shorter, green. *Bracts* somewhat falcate, up to 20 × 3 mm., green. *Flower* c. 18 mm. long. *Pedicel* 5—10 mm. long, elongating slightly in fruit, green. *Calyx* lobes linear, 5—8 × 1 mm., green. *Corolla* tube slightly curved, c. 10 mm. long, 3 mm. diam., white; upper lobes elliptic, 4 × 3 mm., scarcely divergent; lower lip c. 8 mm. long, lobes elliptic, 5 × 3·5 mm.; all lobes white, glabrous inside, sparsely glandular outside. *Stamens:* filaments 4 mm. long, slightly curved, curve somewhat dilated, white, connective toothed, or pilose with long jointed hairs, or often with a combination of tooth and hairs; anther lobes 1 mm. long, white; posterior staminode minute, laterals 2 mm. long, white. *Ovary* 4 mm. long, white, pubescent with glandular and eglandular hairs; style 5 mm. long, sparsely glandular. *Capsule* 15—25 mm. long, 2 mm. in diam.

Flowering period: November to February.

NATAL: Newcastle dist., Normandien Pass, 1935 m., *Hilliard* 1036, NU; Normandien forest, 1996 m., *Hilliard* 1147, NU; Majuba, 2073 m, *Hilliard* 2269 NU; Utrecht dist., Naauwhoek, *Devenish* 495, PRE; Bergville dist., Natal National Park, Goodoo Bush, *Bayer and McClean* 153, NU, PRE; do., *Oliver* 509, NU; Oliviershoek Pass, *Thode* 4342, 4362, STE; slopes of Mont aux Sources, 21-2400 m., *Flanagan* 2099, NBG, PRE; on way to Tugela Gorge, *Schweickerdt* 796, PRE; Hlolela, farm "The Cavern" near Echo Cave, 1750 m., *Hilliard* 812, E, NU; Cathedral Peak, *Schelpe* 984, NH, NU, do., 1843 m., *Hilliard* 809, NU, do., Gogok Caves, 1707 m., *Germishuizen* 38, PRE; Klip River dist., Van Reenen Pass, 1676 m., *Hilliard* 1148, NU. Estcourt dist., Kamberg, *Smuts* 1069, PRE; Kamberg area, farm "Game Pass". *C. Gordon-Gray* 47, NU; Giants Castle, 2700 m., *Symons* 346, PRE; Underberg dist., Bushmans Nek, 2255 m., *Hilliard* 1003, NU; farm "Selborne", 1800 m., *Hilliard* 999, NU; Underberg, *Dyer* 3250, K, PRE; Sani Valley, *Brooke* 56, BM.

ORANGE FREE STATE: Harrismith dist., Nelson's Kop, 1920 m., *Hilliard* s.n., NU; Harrismith, *Sankey* 217, K; Platberg, c. 2000 m., *Putterill* s.n., (in partim) PRE; Rensberg's Kop, Swinburne, Jacobsz s.n., PRE 29744.

BASUTOLAND: sine loc., *Cooper* 947 in partim, K.

CAPE: Maclear dist., Hopedale, Maclear Mt., legit E.M.Y., *Moss* 18454, J; near Maclear, S.W. of Ugie, farm "Pomona", *Farrington* s.n., PRE 29134;

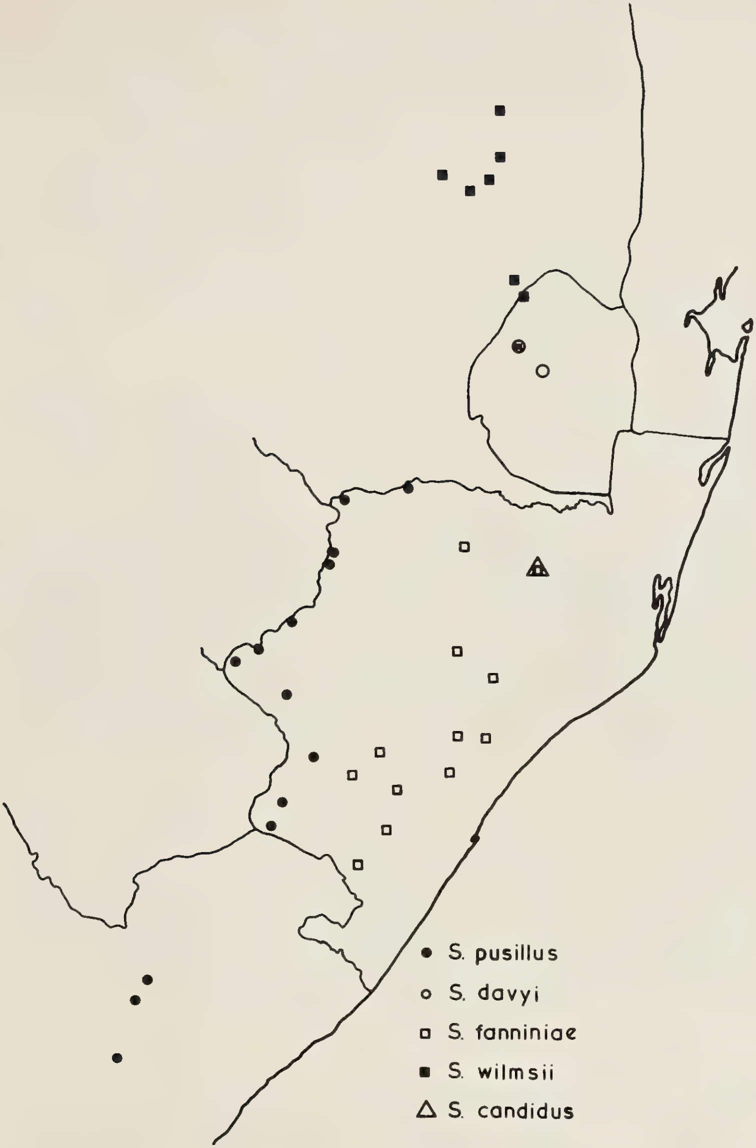

PLATE 5.
Distribution of the five species included in the *S. fanniniae* alliance.

Tembuland, nr. Gatberg, *Baur* 728, K; Engcobo dist., c. 20 mls. E. Engcobo, Gulandoda forest, legit. L. F. Gibson, *Hilliard* 1927, NU.

S. pusillus occurs in the Drakensberg area of Natal and neighbouring mountain regions of the Cape, Basutoland, and Orange Free State, usually at altitudes greater than 1650 m. The apparent distributional gap (Plate 5) between the eastern Cape and Natal can be attributed to lack of collecting in that area.

S. pusillus is commonly found in damp, shady crevices of the Cave Sandstone cliffs that are such a prominent feature of Drakensberg scenery. But it also grows on damp rocks and steep banks in kloof forest, where the plants are often larger than those from exposed rock habitats.

The corolla is usually pure white, but Devenish reported some pale mauve specimens on the farm " Naauwhoek" in the Utrecht district of Natal. There is some variation too in the appendages on the connective, which may be toothed; or bearded with long, jointed hairs, a feature not seen in any other South African species; or there may be a combination of both tooth and hairs.

In *S. pusillus*, a second petiolate flowering leaf often develops at the apex of the hypocotyl opposite the primary leaf, and occasionally a third leaf at the apex of the second petiole. The pattern of branching in the flowering axis is therefore sympodial and identical with that of *S. davyi* and of *S. fanniniae*. The plant is upright, and roots only from the base of the primary petiole (hypocotyl), which is generally well developed. There is no development of accessory leaves from the base of the primary petiole, and the plant is monocarpic. (See Plate 2a). So strong is the floral resemblance between *S. pusillus* and *S. davyi* that growth pattern alone is a reliable diagnostic criterion (cf. *S. wilmsii* and *S. candidus*).

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